CLAIMS:

1. An electrodeless lamp, comprising:

an envelope containing a discharge gas;

a magnetic material core in the envelope;

an induction coil wound around the magnetic material core;

a socket affixed to the envelope for receiving electrical power supplied to the electrodeless lamp;

a driver circuit in the envelope electrically connected to the socket for supplying an oscillatory electric current to the induction coil to operate the electrodeless lamp; and

a heat conduction means thermally coupled to the magnetic material core and the socket for conducting heat generated in the magnetic material core to the socket.

2. An electrodeless lamp according to claim 1 wherein the envelope has a reentry cavity, and the magnetic material core is positioned to be adjacent to the reentrant cavity.

3. An electrodeless lamp according to claim 1 wherein:

the magnetic material core has a hollow portion;

the heat conduction means includes a tube and a cylindrical portion thermally coupled to the tube; and

at least a portion of the tube is positioned inside the hollow portion, and the cylindrical portion is thermally coupled to the socket.

4. An electrodeless lamp according to claim 1 wherein the heat conduction means is formed of a material having a thermal conductivity of 20 W/m•K or higher and an electrical resistivity of 2 Ω•m or higher

5. An electrodeless lamp according to claim 1 wherein the heat conduction means is formed of at least one of a metal material and a ceramic material.

6. An electrodeless lamp according to claim 5 wherein the metal material includes at least one of copper and aluminum.

7. An electrodeless lamp according to claim 5 wherein the ceramic material includes at least one of alumina, aluminum nitride, and silicon carbide.

8. An electrodeless lamp according to claim 3 wherein the socket has a first thread, and the cylindrical portion has a second thread which can be coupled to the first thread.

9. An electrodeless lamp according to claim 3 wherein one end of the tube is thermally coupled to the cylindrical portion, and the other end of the tube is positioned inside the hollow portion of the magnetic core.

10. An electrodeless lamp, comprising:
an envelope containing a discharge gas;
a magnetic material core in the envelope;
an induction coil wound around the magnetic material core;

a driver circuit in the envelope for supplying an oscillatory electric current to the induction coil to operate the electrodeless lamp; and

a restriction means in the envelope for limiting the amount of heat generated in the magnetic material core being transmitted to the driver circuit.

11. An electrodeless lamp according to claim 10 wherein the restriction means is formed of a material having a thermal conductivity of 0.4 W/m•K or less.

12. An electrodeless lamp, comprising:

an envelope containing a discharge gas;

a magnetic material core in the envelope;

an induction coil wound around the magnetic material core;

a driver circuit in the envelope for supplying an oscillatory electric current to the induction coil to operate the electrodeless lamp; and

a configuration means magnetically coupled to the magnetic material core for shaping a magnetic field generated by the electric current flowing through the induction coil so as to aid in directing a resulting magnetic flux to pass through the envelope.

13. An electrodeless lamp according to claim 12 wherein the configuration means includes a disk formed of a magnetic material which is magnetically coupled to the magnetic material core.

14. An electrodeless lamp according to claim 13 wherein the kind of magnetic material in the disk is identical to the kind of material in the magnetic material core.

15. An electrodeless lamp, comprising:

an envelope containing a discharge gas;

a magnetic material core in the envelope;

an induction coil wound around the magnetic core;

a driver circuit in the envelope for supplying an oscillatory electric current to the induction coil to operate the electrodeless lamp;

a heat conduction means thermally coupled to the magnetic material core for conducting heat generated in the magnetic material core to the outside of the electrodeless lamp; and

a heat reduction means magnetically coupled to the magnetic material core for reducing thermal influences of magnetic fields generated by the electric current flowing through the induction coil that are exerted on the heat conduction means.

16. An electrodeless lamp according to claim 15 wherein the heat reduction means includes a disk formed of a magnetic material which is magnetically coupled to the magnetic material core.

17. An electrodeless lamp according to claim 16 wherein the kind of magnetic material in the disk is identical to the kind of material in the magnetic material core.

18. An electrodeless lamp, comprising:

an envelope containing a discharge gas;

a magnetic material core in the envelope having a hollow portion;

an induction coil wound around the magnetic material core;

a driver circuit in the envelope for supplying an oscillatory electric current to the induction coil to operate the electrodeless lamp; and

a heat conduction means thermally coupled to the magnetic material core for conducting heat generated in the magnetic material core to the outside of the electrodeless lamp,

wherein:

the heat conduction means includes a tube thermally coupled to the magnetic core having one end of the tube positioned inside the hollow portion of the magnetic material core.

19. An electrodeless compact fluorescent lamp for use in a suitable fixture, the lamp comprising:

a bulbous transparent envelope;

a discharge gas provided in the envelope;

an enclosure secured between the envelope and a lamp holder engagement structure to provide at least in part an interior space therebetween;

an induction coil positioned adjacent the envelope, the induction coil for forming a plasma in the envelope to produce electromagnetic radiation;

a magnetic field manipulation structure of a magnetically permeable material positioned adjacent the induction coil so as to

separate the induction coil from most of the interior space; and

a primary cooling structure of a thermally conductive material positioned adjacent the magnetic field manipulation structure and in part to extend into the interior space.

20. The device of claim 19 wherein the primary cooling structure has a portion thereof secured between the envelope and the enclosure.

21. The device of claim 19 wherein the primary cooling structure has a portion thereof extending to the lamp holder engagement structure.

22. The device of claim 19 wherein the primary cooling structure has that portion thereof immediately adjacent the magnetic field manipulation structure formed as a tube portion with an end of that tube portion farthest from the enclosure surrounded by a portion of the magnetic field manipulation structure which extends past the end of the tube further from the enclosure.

23. The device of claim 20 wherein there is a thermal insulator positioned between the magnetic field manipulation structure and portions of the interior space.

24. The device of claim 21 wherein there is a thermal insulator positioned between the magnetic field manipulation structure and portions of the interior space.